

ABSTRACT OF THE DISCLOSURE

A high density interconnect device which creates a thin, electrically and thermally high performance package for semiconductor devices having a mechanically stable and high thermal conductivity substrate. Cavities in the substrate accommodate semiconductor devices attached directly to the substrate. The semiconductor devices include at least one optical receiver and/or transmitter. A thin film overlay having multiple layers interconnects the semiconductor devices to an array of pads on a surface of the thin film overlay facing away from the substrate. Connectors are attached to the pads to provide direct electrical and mechanical attachment to other system hardware. In one embodiment, the optical receiver and/or transmitter receives and/or transmits light signals through the thin film overlay. In another embodiment, the optical receiver and/or transmitter receives and/or transmits light signals through holes formed through the thin film overlay. The holes may be back filled with an optical quality material.